



The future of clean cars in Europe: EU Green Deal and EURO 7

P. Dilara

European Commission

DG-GROW

4th Sino-EU workshop on New Emissions Standards and Regulations for Motor Vehicles
March 3-5, 2021

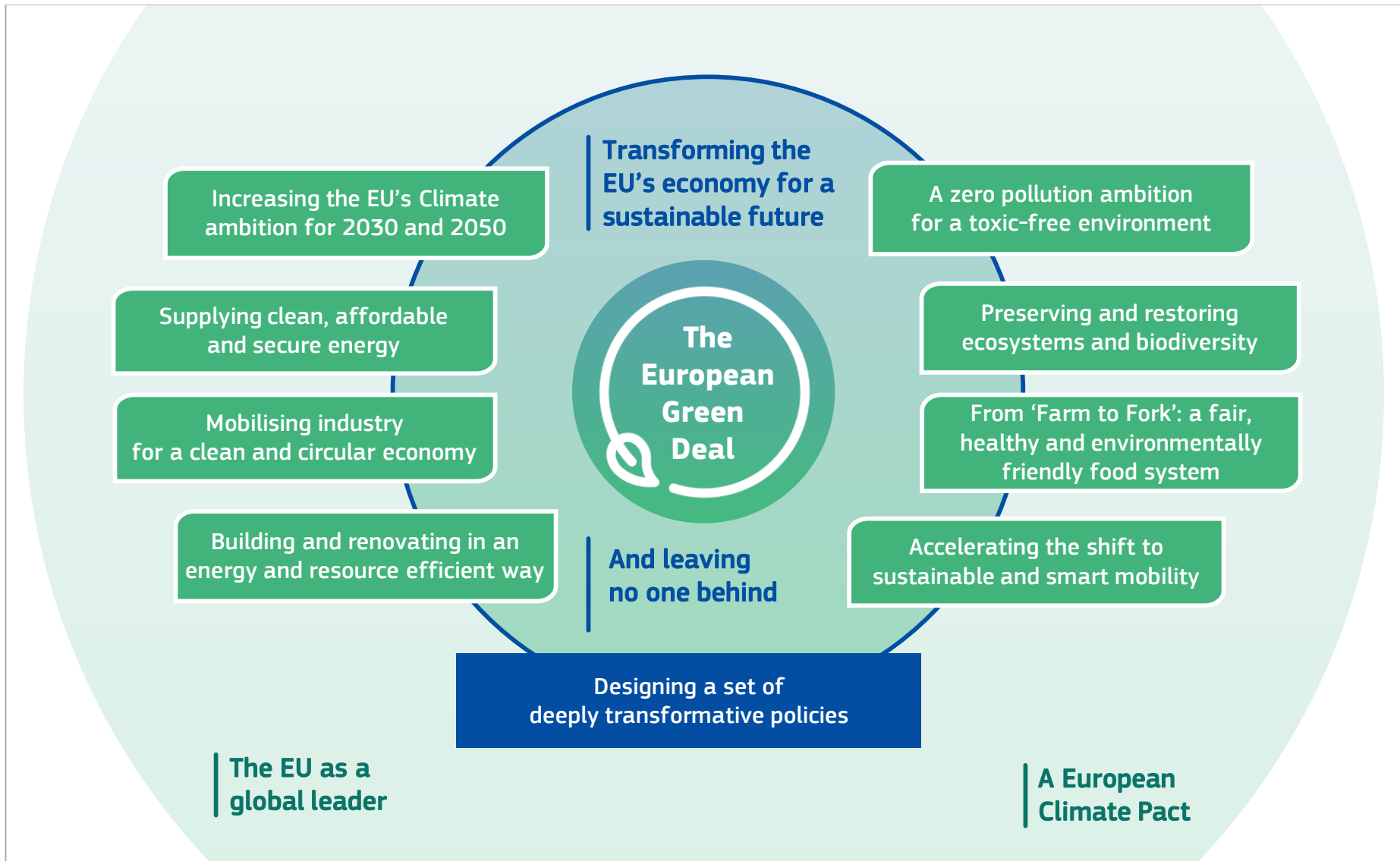
EU Green Deal



EU aims to be climate neutral by 2050

- *Boost efficient use of resources by moving to a **clean, circular economy***
- *Restore biodiversity and **cut pollution***
- *Announced by Commission on 11 Dec. 2019*

The European Green Deal



The European Green Deal

- Strategy for **Sustainable and smart mobility**
- Revise the **CO2 emissions performance legislation** for light duty vehicles by June 2021
- **Extend EU's Emissions Trading** to the maritime sector, and to reduce the free allowances for airlines by June 2021
- Support **public charging points: 1 million by 2025**
- Boost the production and supply of **sustainable alternative fuels** for the different transport modes
- Review the **Alternative Fuels Infrastructure Directive** and the TEN-T Regulation in 2021
- More **stringent air pollutant emissions standards** for combustion-engine vehicles (EURO 7)

Accelerating the shift to sustainable and smart mobility

The EU as a global leader

A European Climate Pact

Sustainable and Smart Mobility Strategy

By 2030:

- > **at least 30 million zero-emission cars and 80 000 zero-emission lorries will be in operation on European roads**
- > 100 European cities will be climate neutral.
- > high-speed rail traffic will double across Europe
- > scheduled collective travel for journeys under 500 km should be carbon neutral
- > automated mobility will be deployed at large scale
- > zero-emission marine vessels will be market-ready

By 2050:

- > **nearly all cars, vans, buses as well as new heavy-duty vehicles will be zero-emission.**
- > rail freight traffic will double.
- > a fully operational, multimodal Trans-European Transport Network (TEN-T) for sustainable and smart transport with high speed connectivity.

Presented on 9 December 2020:

- > https://ec.europa.eu/transport/themes/mobilitystrategy_en

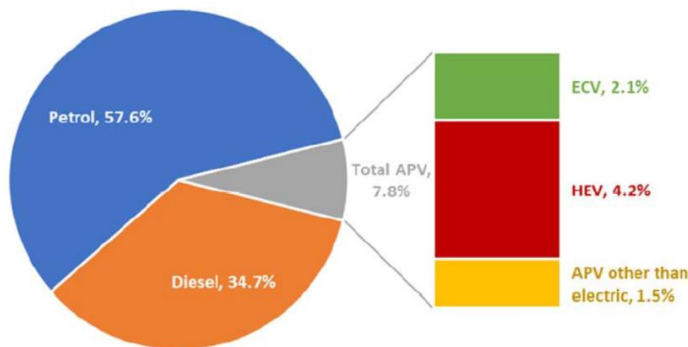
Progress of electrification in Europe

- > Picking up of pace of electrification:
- > 7.8% in late 2018 to 24.6% of the sales in late 2020 for all alternative fuelled vehicles
- > 2.1% to 9.9% for BEV

NEW PASSENGER CAR REGISTRATIONS BY FUEL TYPE
IN THE EUROPEAN UNION¹

Quarter 3 2018

Fuel types of new cars: diesel -18.2%, petrol +15.2%, electric +30.0% in third quarter of 2018

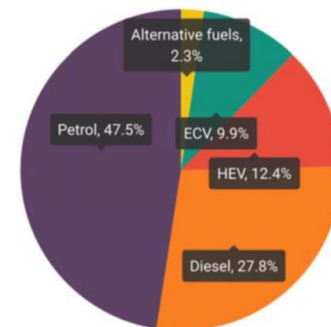


NEW PASSENGER CAR REGISTRATIONS BY FUEL TYPE
IN THE EUROPEAN UNION¹

Quarter 3 2020

Fuel types of new cars: petrol 47.5%, hybrids 12.4%, electric 9.9% market share in third quarter 2020

■ Petrol ■ Diesel ■ ECV ■ HEV ■ Alternative fuels



The European Green Deal

- Initiatives to screen and benchmark **green budgeting practices of the Member States and of the EU** from 2020
- Inclusion of reference to **green public investment** in context of quality of public finance in **review of European economic governance framework**
- Creation of a context for fit-for-purpose **tax reforms**
- Review of the **State aid guidelines for environment and energy**, as well as **other relevant** guidelines in 2021
- Integration of the **Sustainable Development Goals in the European Semester** from 2020

Greening national budgets and sending the right price signals

And leaving
no one behind

Mainstreaming sustainability in all EU policies

Financing the transition

Leave no one behind
(Just Transition)

The European Green Deal

Mobilising industry
for a clean and circular economy

- **EU Industrial Strategy** by March 2020
- A new **circular economy action plan** by March 2020, including a **sustainable products policy**
- **Clean Steel breakthrough**: proposal in 2020 to support zero carbon steel-making processes by 2030.
- Legislation in support of the **Strategic Action Plan on Batteries** and the circular economy in 2020
- Propose legislative reforms **tackling waste**

Designing a set of
deeply transformative policies

The EU as a
global leader

A European
Climate Pact

New regulation proposal on batteries: context

- > Batteries are the major driver to decarbonize road transportation
- > Car manufacturers are launching more than 300 electric vehicle (EV) models in the next five years
- > Need to avoid negative environmental and social effects
 - Lowering the emissions during the production phase
 - Eliminating human rights violations across the value chain
 - Improving repurposing and recycling

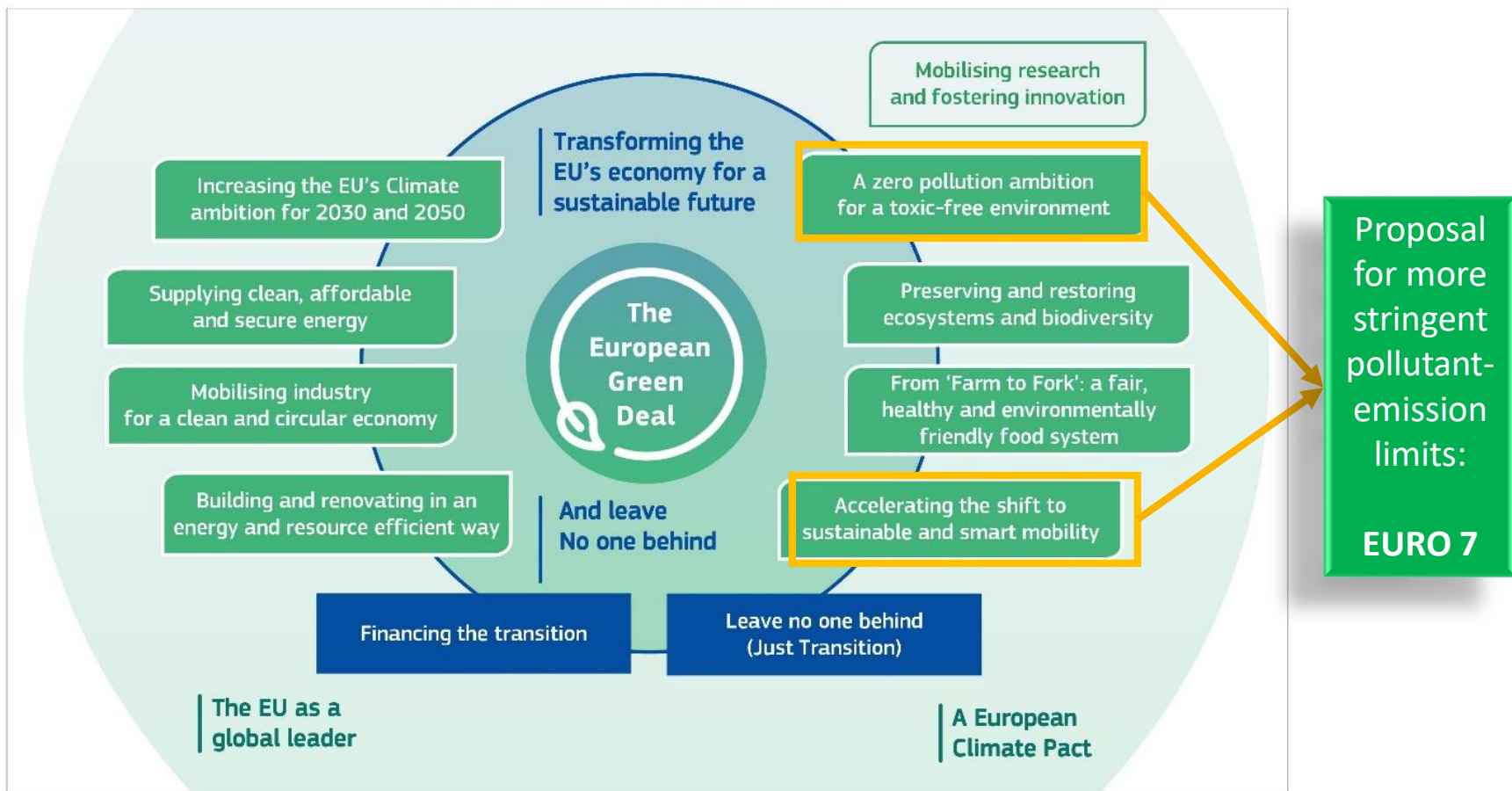
New regulation proposal on batteries: content

- > Addresses sustainability for all types of batteries, but some parts focus on EV (and industrial) batteries specifically as they have the most impact:
 - Carbon footprint over the life cycle: initially a declaration, followed by comparative labelling, followed by a minimum threshold to pass
 - Minimum shares of recycled cobalt, lead, lithium and nickel
 - Supply chain due diligence, based on OECD guidance
 - Facilitating repurposing, incl. access to battery management systems
 - Database with model info; battery passport with individual info

<https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020PC0798>

- > *UNECE Global Technical Regulation on durability of batteries inside the vehicles*

The European Green Deal and Emission Limits for cars (EURO 7)



https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

Emission legislation in the past

- > First emissions legislation in Europe in 1970:
"Council Directive 70/220/EEC of 20 March 1970 the approximation of the laws of the Member States on measures to be taken against air pollution by emissions from motor vehicles"
- > EURO 1 to EURO 6 for Light-Duty Vehicles (LDV)
- > EURO I to EURO VI for Heavy-Duty Vehicles (HDV)
- > But compliance of cars with emissions limits was judged on laboratory tests NEDC/WLTP, evaporative, low-T, etc...
- > The use of defeat devices was strictly prohibited
- > Yet emissions in real life were much higher than in the laboratory

Emission legislation in 2021

- > Big transformation in the compliance of vehicles in real life by introducing testing of vehicles on the road with PEMS* for both LDV and HDV
- > PEMS testing was first introduced as demonstration during type approval and for ensuring in-use vehicle compliance for HDVs
- > RDE testing with PEMS was then introduced both during type approval and in-service conformity of LDVs (2015-2018)
 - Created a lot of interest in the wake of the Dieselgate scandal
 - Ongoing court cases and subsequent changes in legislation
 - On the positive side, **RDE introduction led to cleaner cars in real life (10 fold improvement) and was adopted worldwide**
- > Some issues still require attention, like regeneration of filters, emissions outside RDE boundaries, non-regulated pollutants

PEMS: Portable Emission Measurement Systems

Developing post-EURO 6 emission standards

- > Stakeholder event kicked off process in October 2018
- > Advisory Group on Vehicle Emission Standards (AGVES)
 - 6 meetings up to date, with more than 200 participants
- > 2 scientific studies by CLOVE consortium (LAT, TUG, TNO, Ricardo, FEV, VTT, Emisia) in 2019-2021
- > **Scientific scrutiny by JRC**

All proposals show in the following are only draft proposals from CLOVE and not a European Commission position

CLOVE preliminary emission limit scenarios

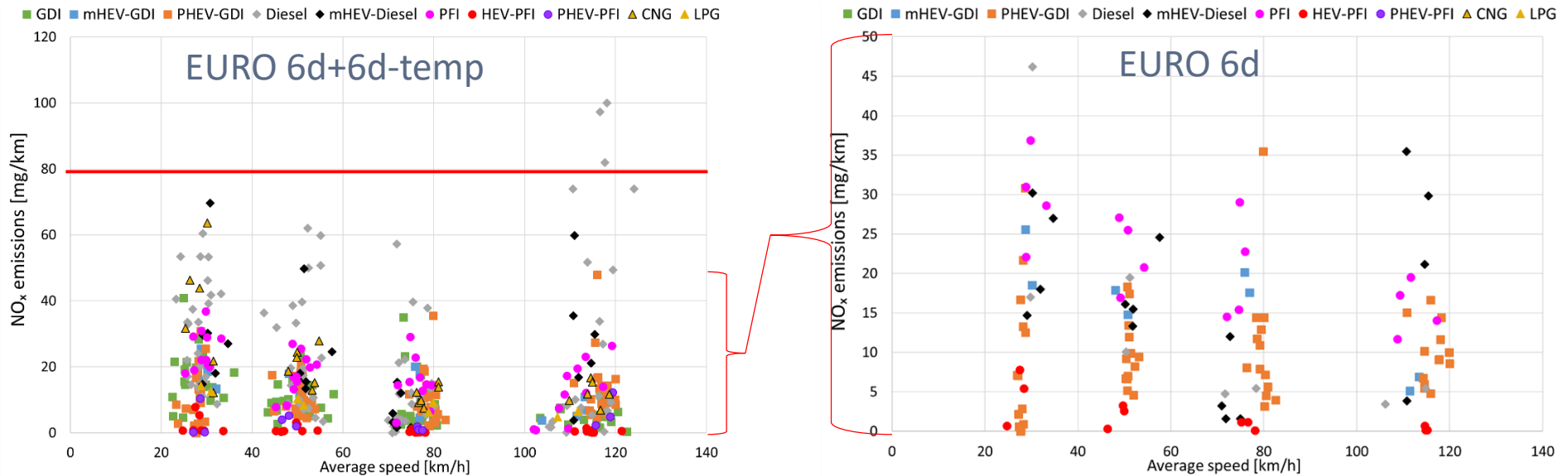
- > First preliminary limit scenarios were presented by CLOVE in Europe in October 2020 as a preliminary input for stakeholder review
- > Based on:
 - data in emission database and related scientific works
 - CLOVE collective expertise
 - announced plans for future technologies
 - Currently reviewed with further input from stakeholders and more test results at boundaries of testing
- > Variations of emission limits will be evaluated as part of the **cost-benefit analysis** needed for the impact assessment of EURO 7

Database of emission measurements

- > Emission performance analysis of latest technology vehicles (Euro 6d/6d-temp LDV and EURO 6 HDV)
- > To determine best available technology (BAT) and emissions reduction potential of each technology and identify and quantify potential improvements
- > Database includes 49 LDVs with results from >500 tests (on 20 October 2020)
- > Test data sourced from 9 sources (CLOVE, JRC, H2020 projects, stakeholders)
- > Parallel work is being performed for HDV

Improved compliance via RDE

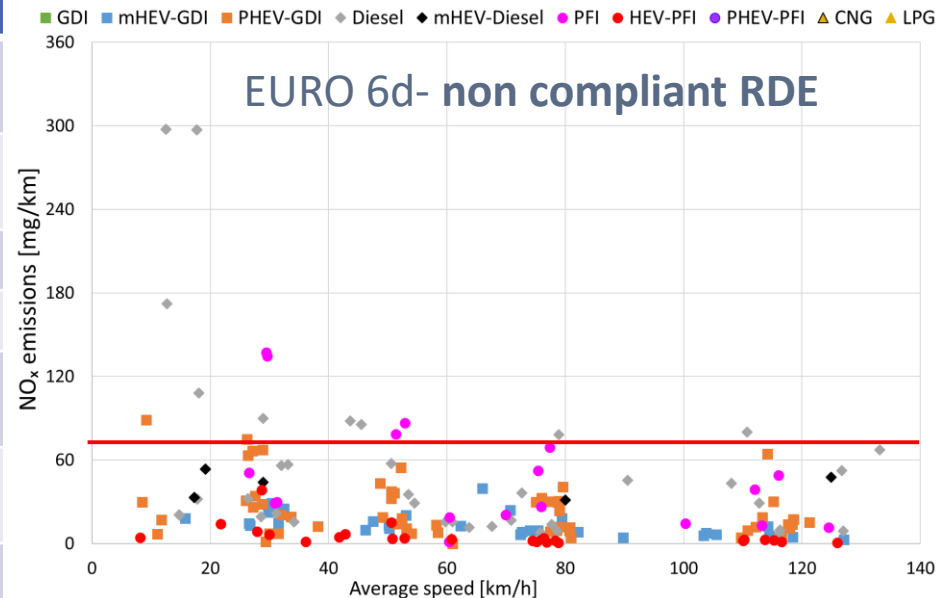
- > Average of 48 pre-RDE EURO 6 diesel vehicles tested in RDE was 443 mg/km in 2016-2017, while EURO 6 emission limits were 80 mg/km
- > Increased compliance is shown in RDE vehicles (49 EURO 6d and 6d-temp vehicles)



RDE boundary conditions

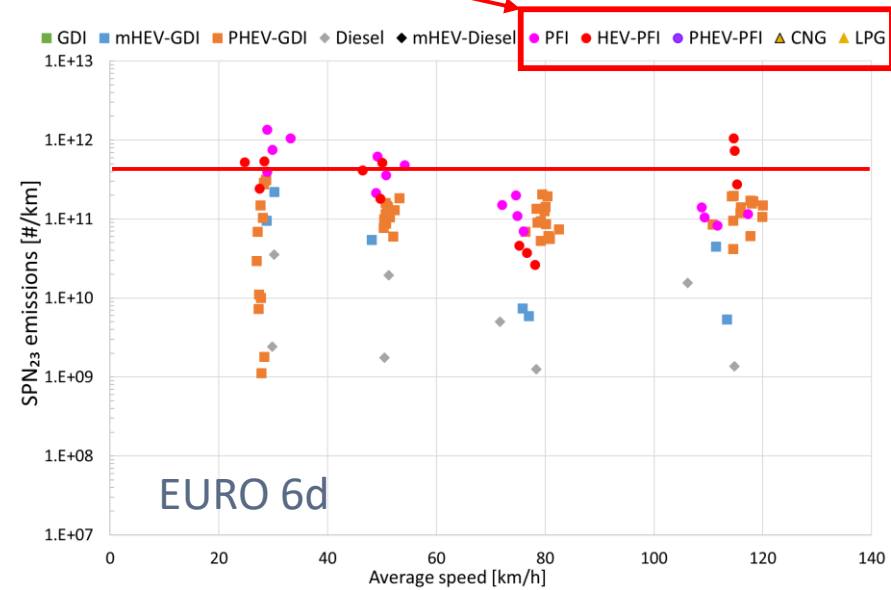
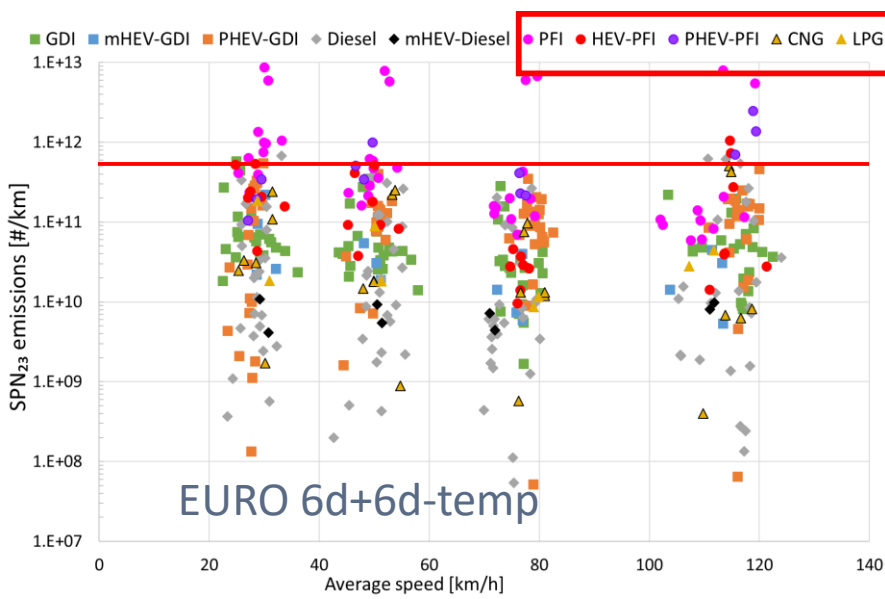
- > In conditions currently non-covered by RDE (*very aggressive driving, high altitudes, high or low temperatures, etc.*) some EURO 6d cars still emit high quantities of pollutants

	Current RDE boundaries
Ambient temperature [°C]	Moderate: 0 – 30 Extended: -7 – 0 & 30 – 35
Average Speed [km/h]	Urban: 15-40 (+ limitations for trip distance and duration, and speed range coverage)
$v \cdot a_{95^{th}}$ [W/kg]	Speed-based calculated limits
Max. altitude [m]	Moderate: 0 – 700 Extended: 700 – 1300
Positive elevation gain [m/100km]	Total: <1200 [m/100km] Urban: <1200 [m/100km]
Durability / Max mileage [km]	ISC 100k MaS 160k
Trip distance	U/R/M >16 km each



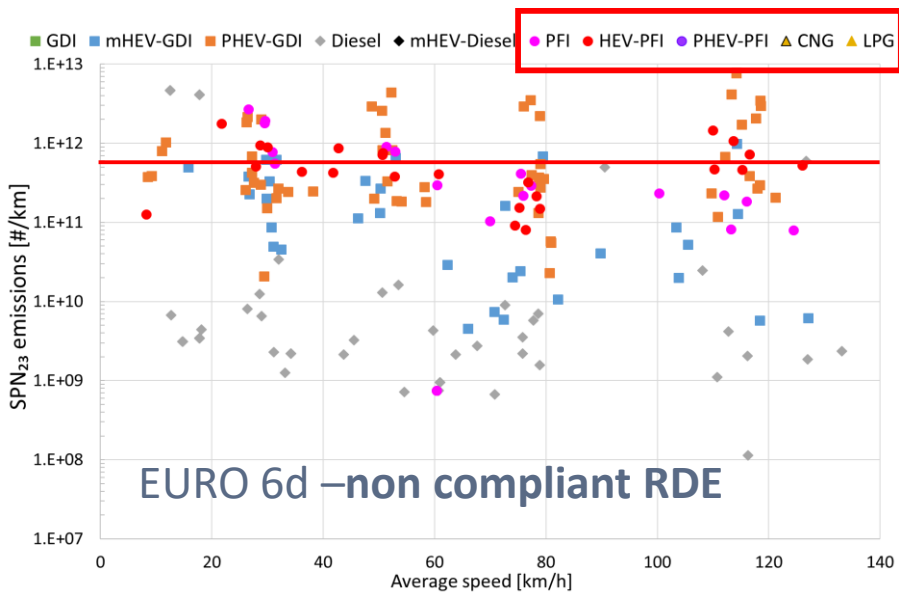
Similar picture for particles

- > Several types of engines still not covered by particle emission limits exhibit higher emissions

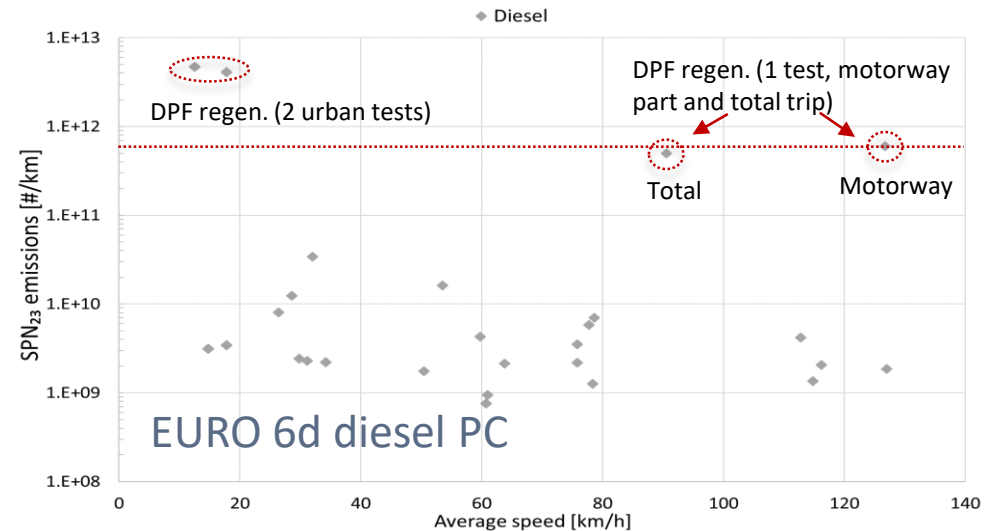


Similar picture for particles

- > Higher emissions are still encountered outside the RDE boundaries and during regeneration of particle traps



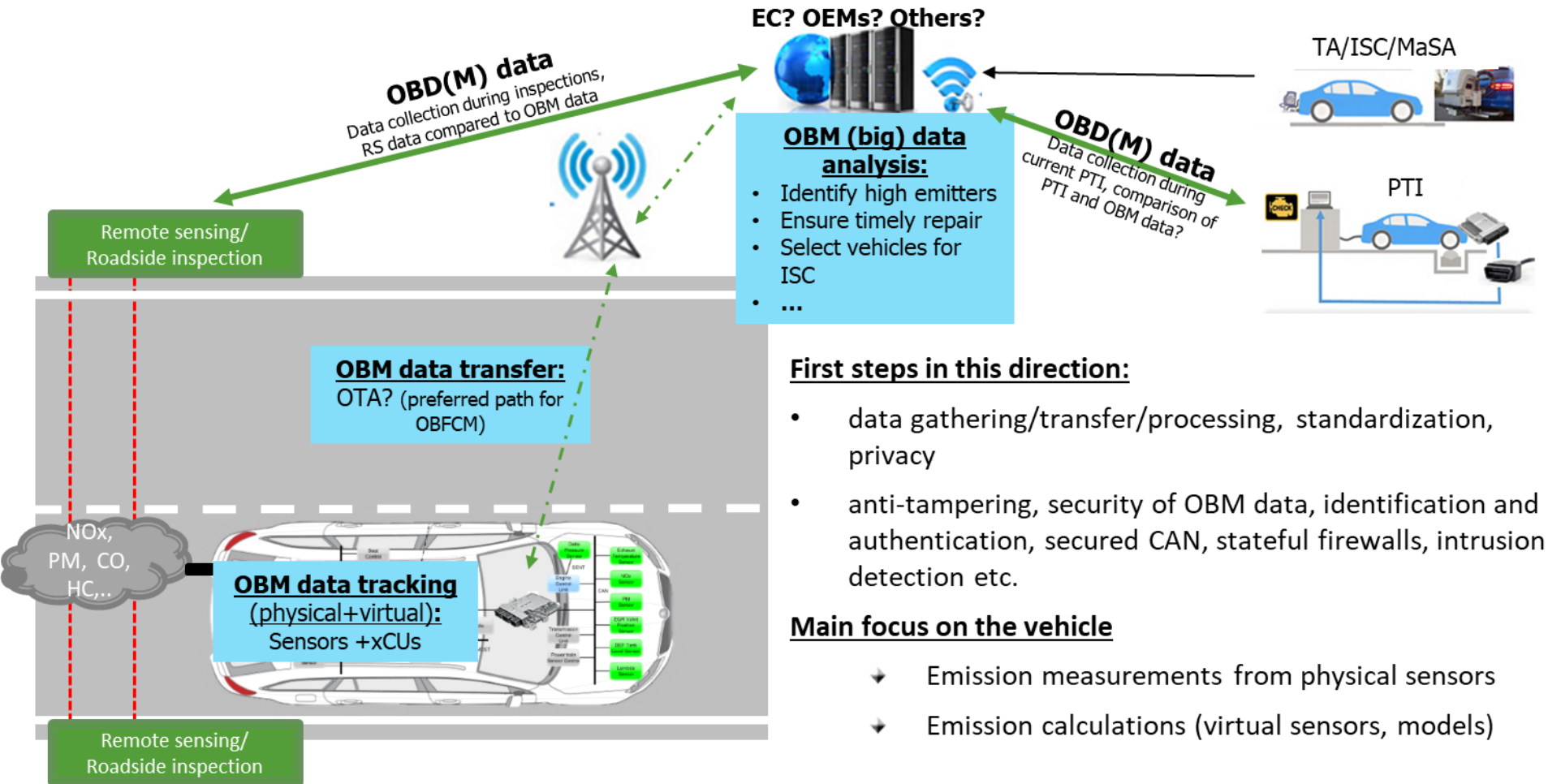
Avg. emissions	w/o DPF Regen.	Incl. DPF Regen.
SPN ₂₃ [# / km]	5*10 ⁹	5.8*10 ¹¹



CLOVE proposal on testing

- > Simplification of Regulation with more emphasis on in-service conformity and market surveillance
- > Wide RDE testing used to confirm compliance of a vehicle in the widest possible conditions of use in Europe
- > Laboratory testing still needed for CO₂ and pollutants currently not measured with PEMS
- > New pollutants: sub-23 nm PN, N₂O, NH₃,
- > Durability tested on whole vehicle up to whole lifetime
- > ...
- > **OBD evolving to On-Board Monitoring (OBM) to ensure lifetime compliance, improve anti-tampering protection and facilitate periodic technical inspection**
- > Solutions are under development for reading data from the vehicles and communication with infrastructure

On-Board Monitoring as a compliance tool



Elements of simplification in CLOVE proposal

- > Single main regulation for LDV and HDV, with different implementing regulations where needed to provide uniform legal basis and requirements
- > Border between LDV and HDV at 3500 kg
- > Equal stringency of limits at 3500 kg border
- > One single introduction data (no new type date, no separate date for LCV)
- > Rationalisation of initial Type Approval, Conformity of Production, In-Service Conformity and Market Surveillance testing

Future steps

- > Public consultation on EURO 7 ended 9 November 2020
<https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12313-Development-of-Euro-7-emission-standards-for-cars-vans-lorries-and-buses/public-consultation>
- > All material from AGVES meetings and other support material:
<https://circabc.europa.eu/w/browse/6325a200-9d24-40fc-8fef-ba1fe4da9702>
- > EURO 7 Proposal from the Commission expected Q4 2021
- > Unsure date of first application date, because of co-decision process
- > But planned as **last emission standard**



Thank you for your attention

For further information:

DG-GROW - Unit C.4
Automotive and Mobility Industries
Penny Dilara
Panagiota.dilara@ec.europa.eu